

Globalization and Development Gap in Developing Countries: A Comparison of Post-Independence Development Trajectories of Ghana and Singapore

Asia Pacific Journal of
Education, Arts and Sciences
Vol. 4 No.3, 114-120
July 2017
P-ISSN 2362-8022
E-ISSN 2362-8030
www.apjeas.apjmr.com

Edward Brenya¹, Samuel Adu-Gyamfi², Edwin Warden³

^{1,2}History and Political Studies Department, Kwame Nkrumah University of Science and Technology; ³Department of Development Studies, University of Adger, Kristianstand, Norway

¹ebrenya@gmail.com, ²mcgyamfi@yahoo.com, ³edwinwarden@yahoo.com

Date Received: June 20, 2016; Date Revised: July 25, 2017

Abstract - *The aftermath of World War II in 1945 witnessed the dawn of a new era of global development system. Over 50 years down the line, globalisation has not brought true global development as is evident in the development gap between countries. The paper examines development trajectories of countries since the colonial era and attempts to explain the factors accountable for the different development levels today. Comparing Ghana and Singapore, the paper argues that in terms of political dispensation, the combined-factors of slave trade and colonialism, coupled with political instability, leadership deficit and institutional incapacity have affected Ghana's development. Similarly, in the economic sector, foreign aid went against Ghana whilst foreign trade and investment favoured Singapore. Finally, education and technology have been the social bedrock for the steady progress of Singapore as compared to Ghana. The paper concludes that, underdevelopment stems from a complex combination of both internal and external political, economic and social factors that are both historic and current. In the end, this paper argues that no single theory or discourse can fully explain development. Rather, an in-depth diagnosis of such historic and current factors provides a stouter platform on which sustainable development can be achieved.*

Keywords: globalization, politics, leadership, economic development, social factor

INTRODUCTION

The current global development system has evolved to promote the progress of states and societies. While many posit that globalization has led to substantial gains in the well-being of millions of people around the globe, a darker side to globalization

coexists, manifested in increasing, unprecedented inequalities both between and within the vast majority of countries [1]. The reality of unequal development between countries has puzzled the minds of many researchers. This raises the question of whether globalization is unfair or if it is a matter of more time?

Modernization theories for example support the idea of the external role of global systems and process that affects development. In contrast, dependency theories challenge the intention of globalisation and external forces and highlight the need for developing internal characteristics. Indeed, no individual factor can determine a country's fortunes or misfortunes. Factors such as peace, investment in human development, industrialisation, political environment, among others, have been variously argued as contributing to a country's development, or otherwise.

The paper examines some discourses on global development gap, with specific comparative reference to two countries; Ghana and Singapore. Using two theoretical perspectives - modernization and dependency, the paper examines the causes of underdevelopment. It also captures an overview of Singapore and Ghana from the lenses of the past - since colonial era into the 21st century. The last section analyzes the major internal and external factors that hindered expected development in Ghana over the period whilst reflecting on what made Singapore develop.

Theoretical Perspectives

This paper draws on two theoretical perspectives to interrogate the issues of development and underdevelopment. The first is the modernization theory which holds the assertion that all societies will progress from a traditional state to a modern state through global systems of economic growth which

will affect other aspects of society [2], [3]. In support, transformational theorists believe that globalization is a central driving force behind the social, political and economic change that is reshaping modern societies [4]. Following modernization theory, Kissinger suggested that just as western countries “Africa's apparent slow march to development is not unique” [5]. This assertion has been largely criticised for being too Eurocentric / westernized, neglecting the individual disparities that exist between states [5]-[6].

In contrast, the dependency theorists argue that, the development gap is a well-orchestrated move by developed nations because the global north and south are in a structural relationship with one another in which the development in the North, leads to the underdevelopment of poor countries in the South. The process in which poor countries were incorporated into the world system, as ‘periphery’ to the ‘core’ wealthy states, has created the development gap. As such, social revolution will be needed to overturn the system [6]-[7]. This should lay emphasis on contextual internal characteristics that make countries develop. This view overlooks the crucial role of global exchange in development.

Considering the two perspectives, while modernization theory stresses on external processes of globalisation that affect development, dependency theory argue that development is a consequence of improving specific internal factors inherent in each country. It must be noted that, none of the theories can fully explain the cause and curse of development. Rather, elements from these perspectives can be drawn at any given point in time to explain factors for explaining development. This paper will be discussed with both external and internal factors.

Background Information

The cross-continental comparison between Ghana and Singapore has been necessitated by imperative similarities between the two. Politically, both countries were colonised by Great British around the same period; Ghana-1844, Singapore-1824. Like Ghana in 1957, self-government was attained by Singapore in 1959 and by the 1960s both countries had gained total independence; Ghana in 1960, Singapore in 1965 [8]. Both countries served as important economic base within their regions before and after independence. Ghana was named the ‘Gold Coast’, for its abundance in gold and other major natural resources. It also became a trading hub for most landlocked countries north of Ghana after the Tema harbour was commissioned in the 1962.

Singapore, though low on natural resources, was an ‘entrepot’-import and export centre [9]. Before moving on, it is important to note that, these similarities do not disregard the possible differences that existed and still exist between the two countries.

At independence, both countries were underdeveloped and had to struggle to survive through the impending decades. The two countries adopted different development trajectories that would determine their future. Today, Singapore has moved from being a third world country to a high income country and plays a major role in the politics and economics of Southeast Asia and beyond [10]. Ghana has remained a third world country until 2011 when it became a lower middle income country [10], a status that is now in contention given its current economic woes.

Table 1: A Comparison of Ghana and Singapore (WEO Economic Indicators)

Indicators	Units	Ghana	Singapore
GDP based on purchasing-power-parity (PPP) per capita GDP	Current international dollar(Billions)	3,536.621	62,427.914
Gross national savings	Percent of GDP	7.496	44.866
Current account balance	U.S. dollars(Billions)	-5.886	53.071

Source: IMF (2013). World Economic Outlook October 2013; Ghana and Singapore

Explaining the development gap-Ghana and Singapore

From socio-economic to political factors, the combination of external and internal factors have accounted for Ghana entrapment in the lower levels of development ladder from the past till now. Acknowledging the probability to misjudge by generalising African countries as “Africa”, it is important to indicate that, most of the factors that affected Ghana may have had similar effects on many other African countries but in different instances and difference magnitudes.

POLITICAL FACTORS

Slave trade, Colonisation and next step towards development.

To understand why Ghana, like other African states, is relatively less developed after being integrated in the global development system, it is

necessary to consider how it was integrated in the first place. Kinade (2004) identifies four phases of incorporation of African states: slave trade (1500s-1880s), colonialism (1880s-1960s), decolonisation and cold war (1960s-1990s) and post-cold war (1900s). It has been argued that these periods of incorporation were the most fundamental and lasting changes in Africa's political and economic systems [11]. Slave trade has had a major toll on Ghana. The frequent and mass slave raids in Ghana severely affected the country in various ways. Particularly, it weakened the social capital and left behind emotional and psychological imprints on affected countries in the long-term. Economically, it hindered the security of private property and drained the youthful capacity necessary to build an economically stable society [12]. These effects though were more impactful some decades ago, have persisted over time and continue to affect contemporary development effort.

With the end of slave-trade in Ghana, the era of colonial rule did little to rebuild the social structure upon which development could be achieved. In Ghana, the divide-and-rule system adopted by the British resulted in ethnic animosities and weak political institutions which presented serious obstacles to nation-building, making development difficult [11]-[12]. By 1960, "roughly 100 linguistic and cultural groups" were recorded in Ghana [13]. Brautigam and Knack (2004) laments that the inability to tackle current development can be traced to the failure of colonialism to develop indigenous institutions. Because slave trade had already drained much human capacity and weakened the social bedrock of Ghana, it was difficult for the country, divided on many ethnic lines to stand on its own.

The combined external forces of slave-trade and colonialism affected internally the socio-political structure of Ghana as well as the external incorporation into the global system. Adopting the dependency theory of development, these processes of incorporation hinders development of developing countries by making them inferior and dependent on the benevolence of the strong colonial and slave master countries. On the contrary, Singapore did not experience the combined effects of slave trade and colonization. Though Singapore was colonised, divide-and-rule system was based on settlement. Because of that, the challenge after independence was to try to forge a national identity within the society made up of only three main groups - Chinese (75.4%), Malays (13.6%) and Indian (8.6%) population [14]. This they did relatively successful by strengthening

national service and bilingualism [15]. Singapore's bilingual policy (English and either Mandarin Chinese, Malay or Tamil depending on father's ethnicity) is perhaps the most unique of its kind in the world [16].

Independence, Political (In) Stability and Development

The significance of political stability in socio-economic development is undoubted. Molhatra et al (2008) maintains that, in addition to the vast human cost that instability creates, political instability undermines any previous development progress, reduces employment and economic activity, and acts as a disincentive to both domestic and foreign investment [1]. A study by Collier (2007, 17-37) estimated that 'conflict trap' reduces growth by around 2.3% and thus it is a cause and curse of poverty [17].

Singapore has gained relative political stability after independence. With no major record of ethnic/border war, the country's political scene since independence has been dominated by one political party - the People's Action Party (PAP). This practice has been noted for "bringing political, economic, and social stability to the island nation" [14]. Contrary to the idea that frequent change of government supports development, Singapore with just one party (and three leaders) in government for 54 years, has seen a massive increase in wealth in the last 46 years, becoming the world's fourth leading financial centre [14].

Though Ghana has not recorded any significant civil war since independence, coups d'états have disrupted the nation and held it back from enjoying stable economic growth. Nine years after independence in 1966, the first military coup was plotted against Dr. Kwame Nkrumah and the Convention People's Party, which dipped the country into two decades of political instability [8]. Since the first coup, the country has been plagued with four major coups and eight different governments until 1981. Political instability and military interference in politics has hindered the good governance, foreign investment and state-society synergy that the country required to build the foundation to boost its economy. In today's lenses, Ghana's geographical position possesses high risk of instability and low investment. Ghana is located close to Cote d'Ivoire, Liberia, and Sierra Leone where recent conflicts undermine the region's economic performance. In contrast, Singapore is bordered by relatively peaceful neighbours like

Malaysia and Indonesia. Supporting this argument, Collier (2007) argues that 'bad neighbours' is characteristic of the bottom billion countries [17].

Political Leadership or the lack of it

Closely related to the stability is political leadership. After independence, Ghana and Singapore had produced two visionary leaders, Kwame Nkrumah (Ghana) and Lee Kuan Yew (Singapore). Coming from different ideological points, they were bent on developing their respective countries. Okyere (2006) suggests that like Nkrumah, Yew envisioned that farming and production of raw materials for multinational companies was not the answer to economic growth. They both embarked on solid industrialization and diversification. Major achievements of Nkrumah's industrialisation were the Akosombo Dam, Tema harbour and many other factories. These were to be the engine of growth in Ghana. Despite having such vision, Nkrumah grew more notorious due to the high debt burden of industrialisation, coupled with corruption, high cost of living and his decision to make himself an autocratic President for life [18]. With good vision but relatively bad approach, "Nkrumah's dream for Ghana was short circuited by some men in uniform in 1966" (Okyere 2006, n.p). Like Okyere (2006), many believe the ousting of Nkrumah has created a leadership deficit that has since not been filled.

While Ghana after 1960s to 1990s was crippled mainly by military leaders, Singapore was on track to achieving what is widely regarded as a "social and economic miracle" and, Lee Kuan Yew's extraordinary leadership is acknowledged as the major driver [19]. His strategic approach to attract investors, high accent to meritocracy, ability to unite the ethnic groups among other factors saw Singapore go through radical directional changes. Okyere (2006, n.p) writes that, "this period saw GDP grew by 9.4% per annum, US\$0.3 billion of foreign direct investment (FDI) yearly and manufacturing became the largest sector with its share of GDP rising from 20% in 1970 to 27% in 1979". For good leadership and stability in leadership, Singapore is now amongst the developed countries of the world. The case of Ghana can be related to what Collier (2007, p. 64) refers to as "bad governance in a small country".

ECONOMIC FACTORS

International Aid versus Trade

Moyo [19] argues that international aid fosters corruption and distorts economies, creating a culture

of dependency and economic laziness which has not merely failed to work, but has compounded Africa's problems. Similarly, Collier [17] proposes that the increase in private capital, through for example trade, as a means to support the bottom billion. So how has aid and trade played out in these two countries [17]. The period after colonialism came the "adjustment-age" in Ghana and other African states with the approach of the IMF and World Bank [20]. With a balance-of-payment deficit inherited by government over government, Ghana under Rawlings had to turn on the IMF for the Structural Adjustment Programmes (SAP) in the 1980s [21].

As argued by Brautigam and Knack, when aid is given by an International Organizations; it comes with stringent conditionality. This was exactly the case of Ghana [22]. The conditions were to allow a floating exchange rate, cutting down public expenditure, reducing public spending, and raising interest rate among others [8]. The consequence of such measures affected the economy in its recovery, making the country even more dependent. As McGillivray and Morrissey (1998) suggests, excessive tied-aid promotes trade dependency. An alternative to borrowing could be to bring in private investments and increase private capital inflow but as discussed above, the early years of post-colonial Ghana proved to be very unstable to attract such investment.

This is exactly where Singapore excelled. With a relatively stable environment by the period after 1960s, Singapore was able to attract foreign investors because of its strategic location and good infrastructure. As it is known, "in the 1960s and 1970s, foreign investors were also given 'goodies' like tax concessions, simplified immigration procedures, tariff protection and exemption from import duties" that was meant to be a boost to attract increasing investment and trade in the country [15]. By 1978, the already liberal foreign exchange controls were lifted totally to allow for greater global trade. Clearly, Singapore had trade and investment but lacked aid whilst Ghana had aid but lacked trade and investment. With the analysis referred to earlier in the section about aid and trade, it is clear lack of investment and trade coupled with over-dependence on aid stifled development in Ghana.

The Natural Resource Curse Theory

Auty (1993), Sachs and Warner (2001), (Kumah-Abiwu, Brenya & Agbodekey, 2015) and other writers on resource curse theory argued that, resource abundance is systematically associated with slow

economic growth and worse development outcomes. Natural resource boom causes a country's exchange rate to initially appreciate, reducing its manufacturing exports, thereby resulting in slow growth rate [23]. In the same vein, resource rich countries tend to neglect other key sectors such as education, essentially because they see their natural resource wealth, not human capital, as the key to the future [24]. The result is that, poor management end up depleting majority of the resources leading to slow development. These views explain the relatively slow rate of development of Ghana.

Ghana has almost every natural resource from gold, diamonds, bauxite and currently oil but lacks entrepreneurial capacity, technology and education to develop it. As a result, the country has been dependant on the raw material for food and export. Over-reliance on natural resources has made the country extremely vulnerable to market volatility [25]. For example, when the price of cocoa fell by two thirds in the 1970s and 1980s, many local producers stopped farming and this affected productivity and revenue [25]. With current fall in oil prices, the country has recorded less than expected revenue from the oil production. Droughts and continued pressure on the market price in 1980s compelled the country to receive emergency assistance from the International Monetary Fund in order to save the country's economy from complete collapse [25].

With virtually no major natural resource, Singapore did not face the resource curse. After independence, 70% of its GDP came from entrepot activities [16]. In a bid to avoid over-reliance on entrepot revenue, in 1965, Singapore began to move into industrialisation and diversification to improve its economy and to create jobs [15]. In 1980, the manufacturing sector accounted for 28% of GDP, as compared to 15 per cent in 1965 with emphasis on higher value added activities. By 1990, Singapore had emerged as a Newly Industrialised Economy [15].

SOCIAL FACTORS

Education and technology are two core ingredients that provide a foundation for development in any country. Ozturk (2001, p. 2) proves a strong link between education and development in terms of "productivity, poverty, trade, technology, health, income, distribution and family structure". Similarly, reports from World Bank (2012) indicate the significance of technology in different sectors of the economy [26].

Education: Survival-driven vs Colonial-driven

Singapore's basic policy has been to maximize the potential of its people and education has been the key factor in this policy [9]. What is worthy of mention is that, "while under colonial rule, education was a tool to meet political and ethnic primordial interests, in 1965 and after, an intimate link between education and economic development was strongly emphasized" in Singapore [16]. This was not same for Ghana as Ghana continued to follow the colonial education system [8]. From 1965-1978, the period of "survival-driven education" was fully introduced which laid emphasis on technical and vocational education as a means to improving on technology to achieve export-oriented industrialization [16].

After independence, Ghana placed priority on education as well. Although free compulsory basic education was introduced by 1960, it was not managed properly and not technically inclined and by 1980 "education could be described as decayed" [27]. The decay was a result of "political instability with its resulting poor management, corruption, and general macroeconomic turmoil" [27]. Around this same time in 1979, a New Education System (NES) was introduced in Singapore that moved towards quality after attaining the quantities [16]. Moreover, not serious attention was given to technical and vocational training in Ghana, as in Singapore. Today, Singapore's education system has been described as "world-leading" and has won international recommendation including one by the British Education Minister Michael Gove [28].

Technology

Technology has been the major aspect of education in Singapore. Following modernization principle, the Singapore government operated an open-door policy in an attempt to close the technological gap after independence [16]. As such more Multinational Corporations (MNCs) and foreign expertise were attracted into the city-state to provide the impetus for an industrial take-off [16]. According to Emihe (2008, p19), "Ghana rejected assistance from experts as its leaders viewed independence uniquely from the perspective of political freedom while relegating economic freedom, industrial growth" [9]. Though, this idea of independence without dependence is not solely valid records indicate that, foreign experts and firms such as Kaiser Corporation, were involved in early technological projects, [29], it indicates to some extent, how subsequent military and civilian governments had not

taken industrialisation and technology as serious as Nkrumah did [8].

By 1979, Singapore had begun restructuring into high technology in which mechanization, automation and computerization of industry were promoted [8]. It was not until 1994 that technology was introduced in Ghana, with two computers to more than 200 people [30]. Today, Singapore is a developed country because, “it is the high-tech leader of Southeast Asia, a commercial entrepot and a scientific centre” [14]

CONCLUSION

Singapore and Ghana have both been tagged as third countries during the early post-colonial era. Fifty years later, Singapore has achieved staggering success ahead of Ghana. The paper is discussed mostly within the time frame of colonial era to current date, though more weight has been on the historical factors that affected or pumped the early progress. The discussions have partly considered external factors as the cause of (Ghana’s) underdevelopment and partly emphasised the domestic characteristics. Among the numerous perspectives and factors espoused to explain the phenomenon, this paper argues that when colonization is met with slave trade, the combined effects of socio-psychological inferiority and weak political and economic institutions can affect development, in line with dependency theory. In the same direction, leadership deficit and political instability have been negative factors as well, as shown in the case of Ghana. Over-reliance on foreign aid to meet budget deficit has proven detrimental to Ghana’s economy to some extent, putting more debt pressure on the country.

Effective international trade between the Singapore and the outside world resulted in economic success. In this regard, the modernization approach is partly useful in explaining how countries can progress within the global system while dependency theory partly explains how countries can be stacked by debts due to excessive aid flow. In a nutshell, it is therefore concluded that, (Ghana’s) underdevelopment stems from a complex combination of both internal and external political, social and economic factors that are historic and current. Clearly, no single theory or discourse can fully explain the development of trajectories of Ghana and Singapore. Rather, an in-depth diagnosis of historic and current factors provides a stouter platform upon which effective policy decision can be made for sustainable development to be achieved. This paper has clearly provided a detailed analysis of the post-independence

developmental processes by looking at the developmental trajectories of Ghana and Singapore from the historical, social, political, economic and technological perspectives. It is hope that this analysis can serve as a conduit to inform policy and developmental program in developing countries, especially that of Ghana in particular.

REFERENCES

- [1] Malhotra, K., Ahouilhou, N., Eshmambetova, Z., Kirungi, F., Ladd, P., Mermet, L., Nuamah, R., Say, D., Tekneci, H., and Ustay, Y. (2008). Making Globalization Work for the Least Developed Countries. Retrieved from <http://tinyurl.com/nwwvkqx> Accessed on 01.10.13
- [2] Linklater, A. (2011). International society and the civilizing process. *Ritsumeikan International Affairs*, 9, 1-26.
- [3] Rostow, W. (2002). W., (1960), “The Stages of Economic Growth: A Non-Communist Manifesto”. pp. 9-10
- [4] Halsall, J. P., & Cook, I. G. (2013). Globalization impacts on Chinese politics and urbanization. *Chinese Studies*, 2(02), 84.
- [5] New African (2013/07) IMF is optimistic about Africa's future. Retrieved from <http://www.newafricanmagazine.com/special-reports/other-reports/new-african-markets/imf-is-optimistic-about-africas-future>. Accessed on 1/11/13
- [6] Baran, P. A. (1957). *The Political Economy of Growth*, New York (Monthly Review Press) 1957.
- [7] Woods, N. (2008). Whose aid? Whose influence? China, emerging donors and the silent revolution in development assistance. *International Affairs*, 84(6), 1205-1221.
- [8] Okyere, B. (2006) Comparing Ghana to Singapore. Ghana web. Retrieved from <http://www.ghanaweb.com/GhanaHomePage/features/artikel.php?ID=100884&comment=0#com>. Accessed on 25/10/13
- [9] Emihe-I, A. (2008) Capacity building in developing countries: Ghana and Singapore –case study. Long Island University, New York, U.S.A.
- [10] IMF (2013). *World Economic Outlook October 2013; Ghana and Singapore*. Retrieved from <http://tinyurl.com/p2ycqfj> Accessed on 3/11/13.
- [11] Kidane, M. (2004). Africa's Intrastate Conflicts: Relevance and Limitations of Diplomacy. *African Studies Association*. Retrieved from <http://www.jstor.org/stable/1535098> Accessed on 04/11/2013
- [12] Nunn, N. (2007). Historical legacies: A model linking Africa's past to its current underdevelopment. *Journal of development economics*, 83(1), 157-175.

- [13] Ghana web (2013) Ethnic Groups. Retrieved from <http://www.ghanaweb.com/GhanaHomePage/tribes/>. Accessed on 5/11/13.
- [14] New African (2013/03). What Africa can learn from Singapore (part1)? Issue 526, p24-28. 5p. Retrieved from <http://tinyurl.com/q5taf69> Accessed on 17.10.13
- [15] Asiaone (2013). Singapore dreams. Retrieved from <http://ourstory.asia1.com.sg/dream/dream.html>. Accessed on 25/10/13
- [16] Boon, G. C., & Gopinathan, S. (1965). The development of education in Singapore since 1965. Toward a better future, 12.
- [17] Collier, P. (2007). The Bottom Billion; why the poorest countries are failing and what can be done about it. New York: Oxford University Press, 2007, pp. 224.
- [18] Watkins, T., Valley, S. and Alley, T.(2013) Political and Economic History of Ghana. Retrieved from <http://www.sjsu.edu/faculty/watkins/ghana.htm> Accessed on 4/0/13
- [19] Moyo, D. (2009) "The World of Aid," in *Dead Aid: Why Aid Is Not Working and How There Is a Better Way for Africa*, pp. 1-70. New York: Farrar, Strauss, and Giroux.
- [20] McNiel, J. M., & Fleeson, W. (2006). The causal effects of extraversion on positive affect and neuroticism on negative affect: Manipulating state extraversion and state neuroticism in an experimental approach. *Journal of Research in Personality*, 40(5), 529-550.
- [21] Brenya, E., & Asare, B. E. Traditional Institutions and Agenda Setting: The Case of the Adoption of the Ghana Education Trust Fund. *African Research Review*, 5(3).
- [22] Bräutigam, D. A., & Knack, S. (2004). Foreign aid, institutions, and governance in sub-Saharan Africa. *Economic development and cultural change*, 52(2), 255-285.
- [23] Sachs, J. and Warner, A. (2001) The curse of natural resources. *Natural Resources and Economic Development*. *European Economic Review* 45 (2001) 827}838.
- [24] Gylfason, T. (2001). Natural Resources, Education and Economic Development. *European Economic Review*, 45/4: 847-59
- [25] Gepecghana (2010). The Exports of Ghana. Retrieved from www.gepcghana.com/exports.php. Accessed on 15.10.13
- [26] World Bank (2012) Information and Communication Technology is Revolutionizing Development in Africa. Retrieved from <http://tinyurl.com/npb78m4>. Accessed on 3/11/13
- [27] Eyiah, K. (2004). Brief History of State-Organized Education in Ghana. Retrieved from <http://www.ghanaweb.com/GhanaHomePage/features/artikel.php?ID=54812> Accessed on 1/11/13
- [28] Baker, M. (2010). Schools In a curriculum vacuum' Education and Family. BBC News. Retrieved from <http://www.bbc.co.uk/news/10355207> Accessed on 1/11/13
- [29] World Bank Achieves (2013). First Funding for Ghana - Volta River Hydroelectric Project, 1962. Retrieved from <http://go.worldbank.org/0TOFT76XS0> Accessed on 5/11/13
- [30] Ghana web (2013b) Science and Technology. Retrieved from <http://www.ghanaweb.com/GhanaHomePage/technology/>. Accessed on 23/10/13